

Exhibit 6

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**IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF NORTH CAROLINA**

SHAUNA WILLIAMS, et al.,

Plaintiffs,

**REPRESENTATIVE DESTIN
HALL, in his official capacity
as Chair of the House Standing
Committee on Redistricting, et al.,**

Defendants.

Civil Action No. 23 CV 1057

**NORTH CAROLINA STATE CON-
FERENCE OF THE NAACP, et al.,**

Plaintiffs,

v.,

**PHILIP BERGER, in his official ca-
pacity as the President Pro Tempore
of the North Carolina Senate, et al.,**

Defendants.

Civil Action No. 23 CV 1104

**EXPERT REPORT OF SEAN P. TRENDE, Ph.D.
Part II: In Response to Mr. Anthony E. Fairfax**

additional “training” of the eye is unnecessary, and they are so close to 50% + 1 BVAP that there is no need to identify a compact subsection of the population. Nevertheless, the conceptualization behind it is useful for examining population compactness here.

4.3 Methods for examining compactness of districts

Mr. Fairfax proposes three ways to examine the compactness of the districts, all of which relate to the compactness of the district shape. First, he suggests comparing the range of Reock and Polsby-Popper scores between the Enacted Maps and the proposed alternatives. Fairfax Report ¶85. Second, he suggests comparing the planwide average of scores for a district map to the planwide average of scores for an alternative map. Fairfax Report ¶ 86. So he concludes, for example, that the mean Reock for Fairfax House Plan A is 0.43, and the mean Reock for the Enacted House Map is 0.44. Likewise, the Polsby-Popper for Fairfax House Plan A is 0.34 and for the Enacted House Plan it is 0.35. Finally, he suggests comparing the Black majority districts in his map to their predecessors in the Enacted Plans.

There are problems with all of these aggregated approaches. Setting aside the hair-splitting question of when a difference in average score grows large enough that plans are no longer “similar,” *id.* ¶86, the averages he suggests are problematic for three reasons. First, in my understanding, the inquiry into a VRA district is supposed to be specific to the district, not based on aggregates.

Second, the statewide averages are problematic because not every district is changed. That allows significant changes to either be subsumed into the average or covered up by making a different district more compact. This is a special concern when the map has a large number of districts, as the North Carolina House has, many of which the Legislature has little or no discretion over drawing due to state law restrictions.

Consider the Enacted House Map, which has an average Reock score of 0.416. District 1 in the Enacted Map has a Reock score of 0.4666.² Assume that it and District

²Note that some of my Reock Scores different from Mr. Fairfax’s. I don’t know the reason for this discrepancy. Things such as the amount of granularity in a shapefile or the projection used can alter a

2 were drawn in such a way that their Reock scores became 0.01 – extremely non-compact districts by any telling. The result of this, however, is that the mean Reock score for the map would fall only to 0.408. Or imagine that District 1 were drawn down to 0.01, but that Districts 2-4 were drawn to increase their compactness to 0.8. The resulting map would see an improvement in its Reock score, even though District 1’s compactness had collapsed.

Finally, only looking at the minority-majority districts and their predecessors can overlook substantial changes that can occur as immediate second-order effects of the line drawing. As we will see, Mr. Fairfax draws one such very compact Illustrative district, but it forces another district to become very distended and non-compact.

5 Examination of Fairfax Illustrative House Maps A and B

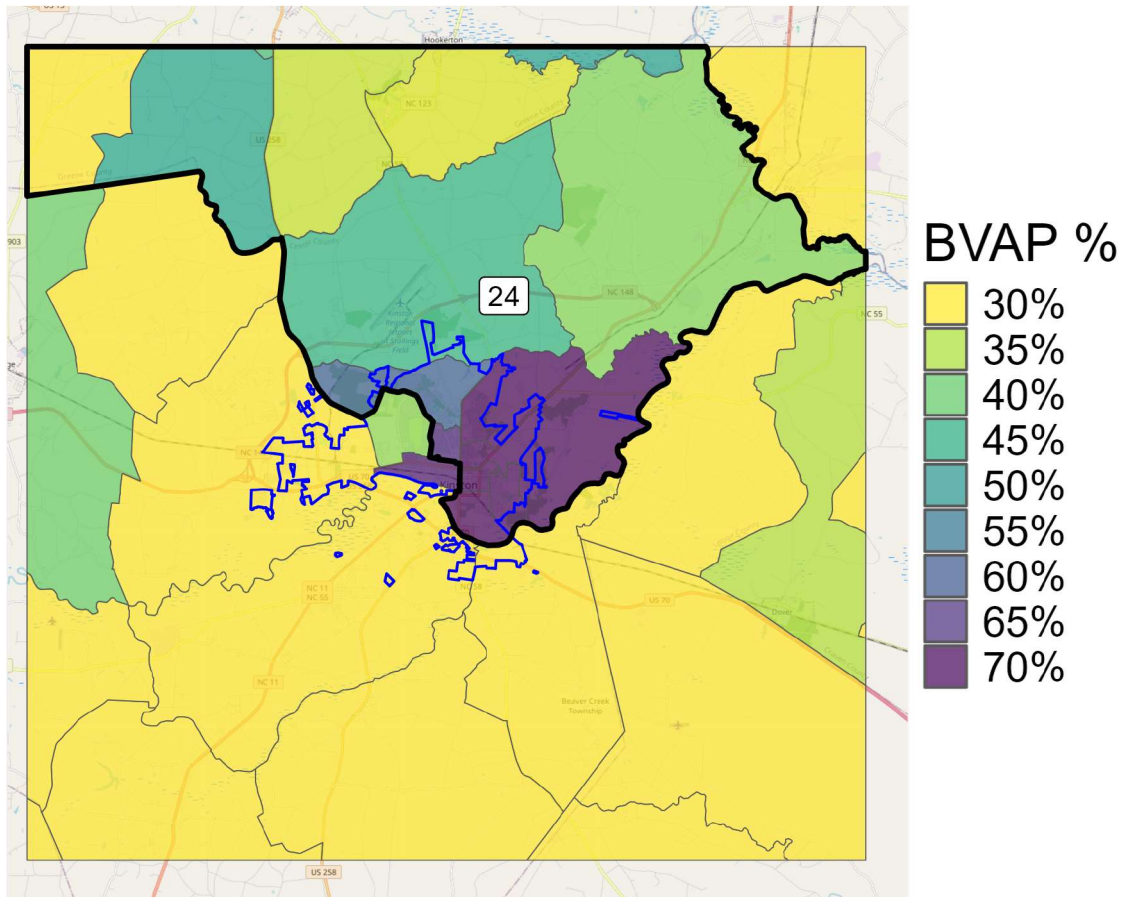
5.1 House Map A

5.1.1 Compactness

Map A redraws 16 of the North Carolina House’s 120 Districts. Those districts are 1, 3, 4, 5, 7, 8, 9, 10, 12, 13, 23, 24, 25, 27, 32, and 79. Comparing the mean compactness of the Enacted House Map to that of Map A is therefore mostly unhelpful, as 104 of the districts are identical. As discussed above, this can cover substantial changes in those 16 districts, and will tend to make the Illustrative Map appear compact naturally. At the same time, even a compact majority-black district can have substantial second-order effects on districts that may have significance. For example, Illustrative District 27 in Map A is quite compact, and appears more compact than the Enacted Map’s version of District 27. However, by moving Illustrative District 27 westward, Illustrative District

Reock or Polsby-Popper score. I have checked my calculated Reock scores against those computed by Dave’s Redistricting App, and they are generally within a few ten-thousands of a point, which suggests that I am at the very least using a projection and shapefile set that is in line with that used by other redistricting experts.

Figure 37: Fairfax Illustrative Map B District 8 BVAP, Kinston zoom



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6 Examination of Fairfax Illustrative Senate Maps

The State Senate Illustrative maps are even more straightforward. Mr. Fairfax's Illustrative Senate Maps involve the redrawing of districts 1, 2, 3, 4, 5 and 11. Both feature a Black majority District 2.

We start with our familiar tables. The average Reock score for the redrawn senate

districts in Illustrative Map A declines from 0.379 to 0.341. For Polsby-Popper, the average declines from 0.269 to 0.247. We can see specific effects in the table below. In particular, Districts 1-3 become more compact than under the Enacted Map, while Districts 4, 5, and 11 become less compact. The biggest difference in Reock score is found in District 4, which declines from 0.53 to 0.31, while the biggest difference in Polsby-Popper is District 5, which declines from 0.34 to 0.18.

Figure 38: Comparison of Compactness, Senate Illustrative Map A and Enacted Map

District	Reock, Enacted	Reock, Map A	Polsby-Popper, Enacted	Polsby-Popper, Map A	Map A < Enacted, Reock	Map A < Enacted, PP
1	0.24	0.41	0.21	0.32		
2	0.21	0.27	0.10	0.26		
3	0.35	0.51	0.18	0.23		
4	0.53	0.31	0.41	0.26	No	No
5	0.45	0.26	0.34	0.18	No	No
11	0.49	0.28	0.38	0.24	No	No

Illustrative Map B is better, with the districts typically appearing more compact than the Enacted Map. The overall compactness improves under both the Polsby-Popper (from 0.269 to 0.307) and Reock (from 0.379 to 0.432) scores.

Figure 39: Comparison of Compactness, Senate Illustrative Map B and Enacted Map

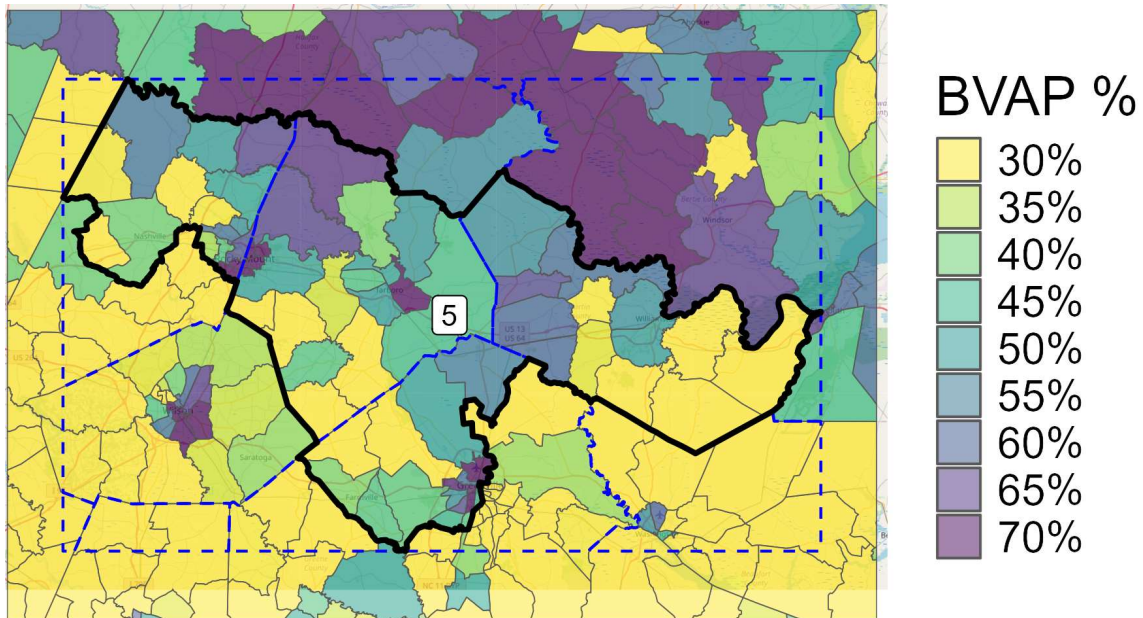
District	Reock, Enacted	Reock, Map A	Polsby-Popper, Enacted	Polsby-Popper, Map A	Map A < Enacted, Reock	Map A < Enacted, PP
1	0.24	0.37	0.21	0.32		
2	0.21	0.27	0.10	0.26		
3	0.35	0.47	0.18	0.21		
4	0.53	0.56	0.41	0.33		No
5	0.45	0.45	0.34	0.34		
11	0.49	0.47	0.38	0.39	No	

6.1 Illustrative Map A, District 5.

We begin with Illustrative Map A, District 5. Under the Enacted Map, the district is 40.3% BVAP and consists of whole counties Pitt and Edgecombe. It is heavily Democratic, and voted for Democratic candidates in all 8 of the elections in the Election Index. It has an overall Democratic performance of 56.1%.

Senate Illustrative Map A transforms this into a district that splits two counties, including a three-way split of Pitt County. If one rotates the district 45 degrees, it resembles a kid's dinosaur chicken nugget. It is 50.4% BVAP.

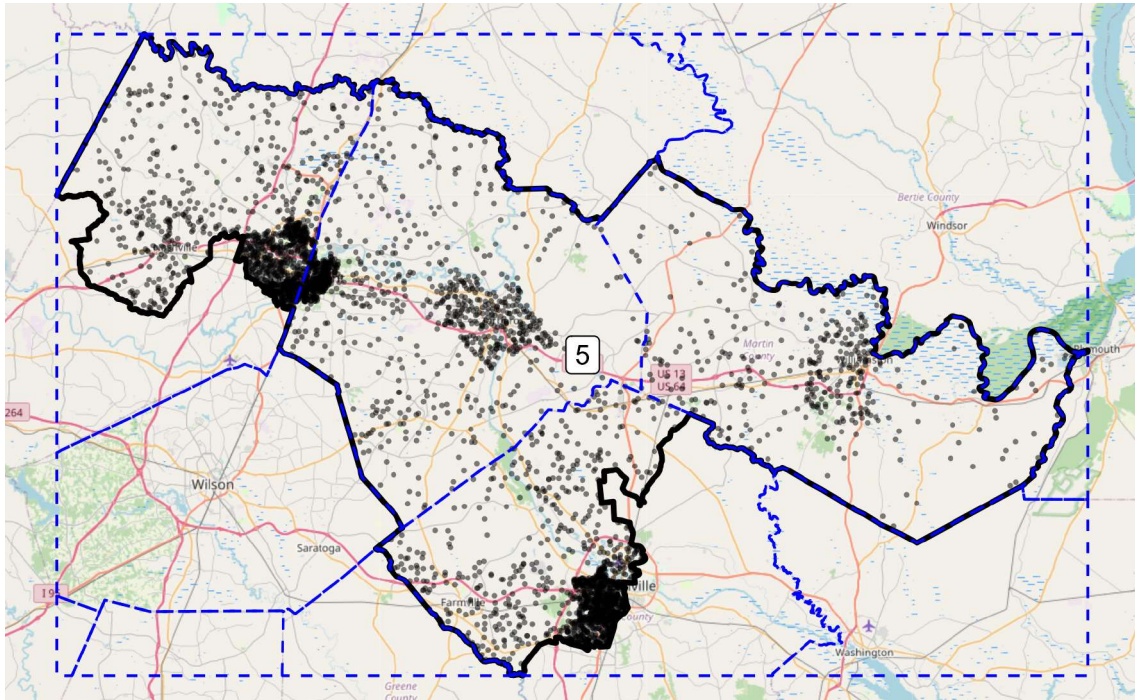
Figure 40: Fairfax Senate Illustrative Map A District 5 BVAP



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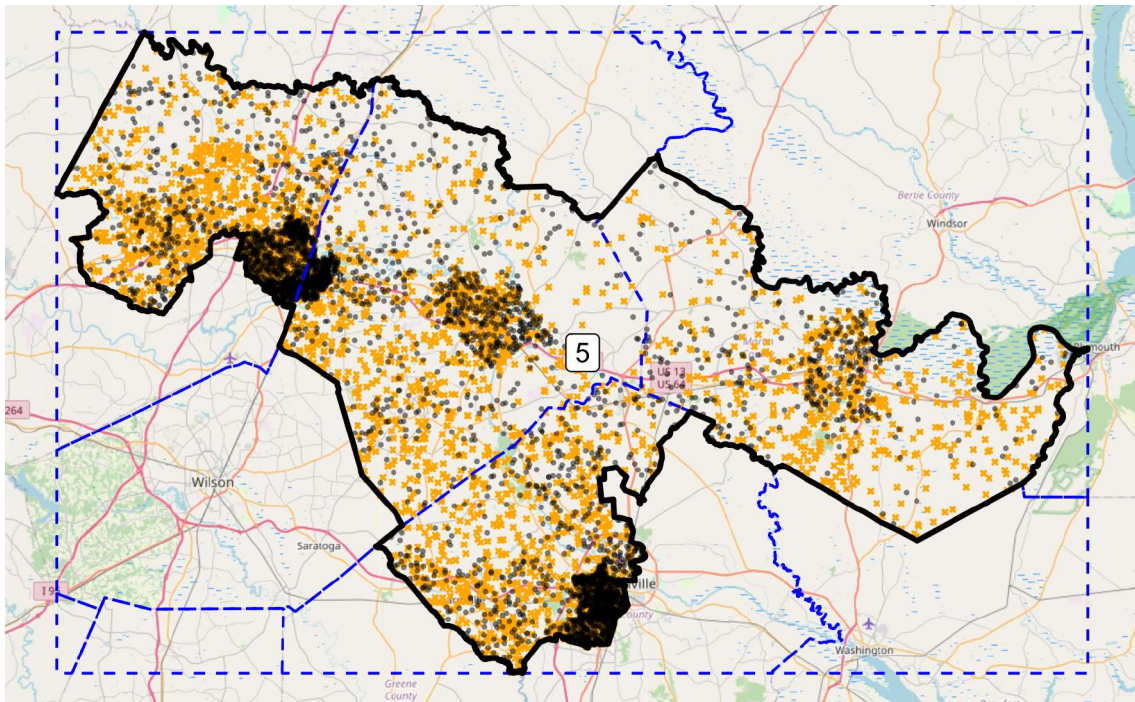
But regardless, we can plainly see that the district functions by once again stitching together geographically disparate clusters of Black residents of voting age. Because the district is drawn so close to the 50% BVAP line, it relies upon scattered Black residents in otherwise-white areas of the counties it spans to achieve majority BVAP status.

Figure 41: Dot Density Map of Fairfax Senate Illustrative Map A District 5



(a) One black dot = 20 Black residents of voting age

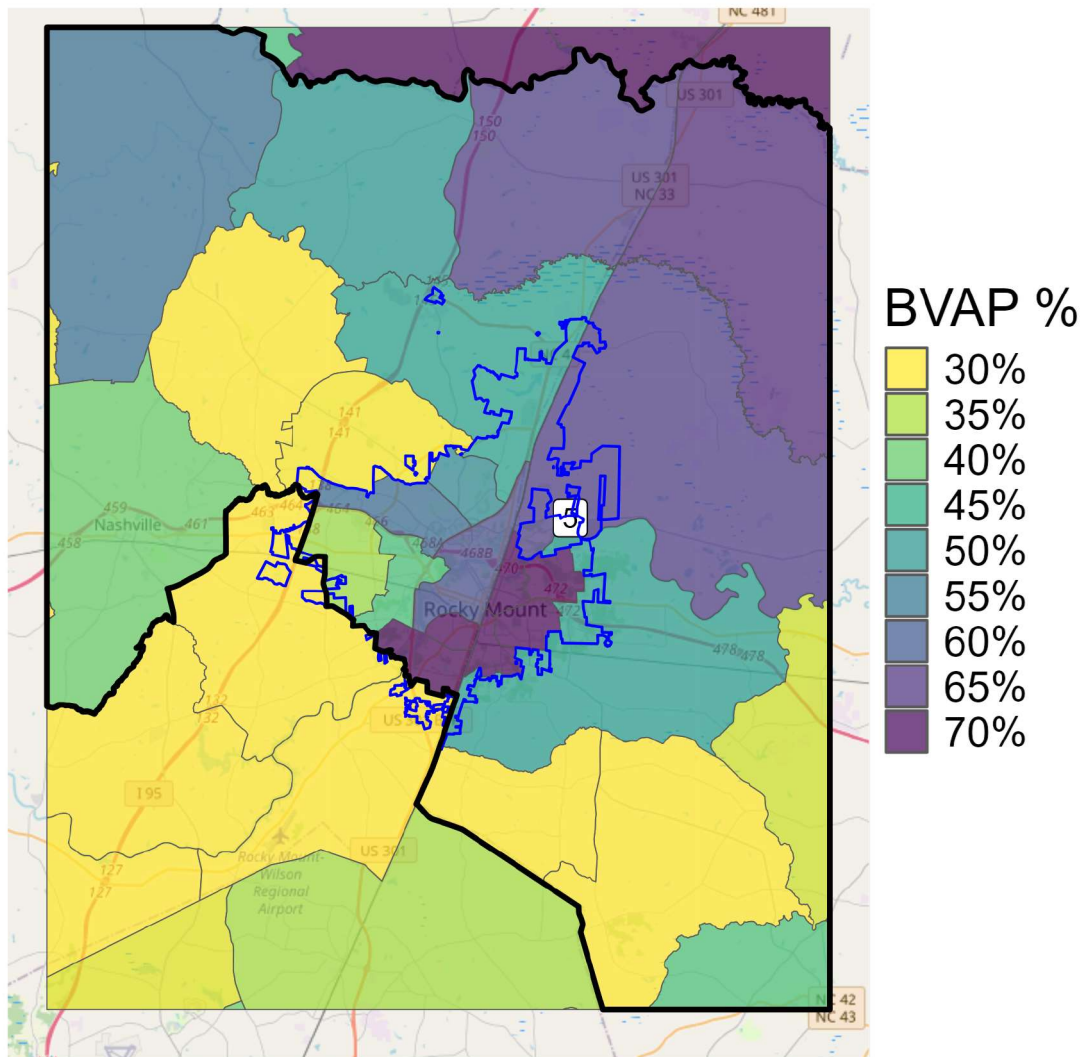
Figure 42: Dot Density Map of Fairfax Senate Illustrative Map A District 5



(a) One black dot = 20 Black residents of voting age. One orange x = 20 non-Black residents of voting age

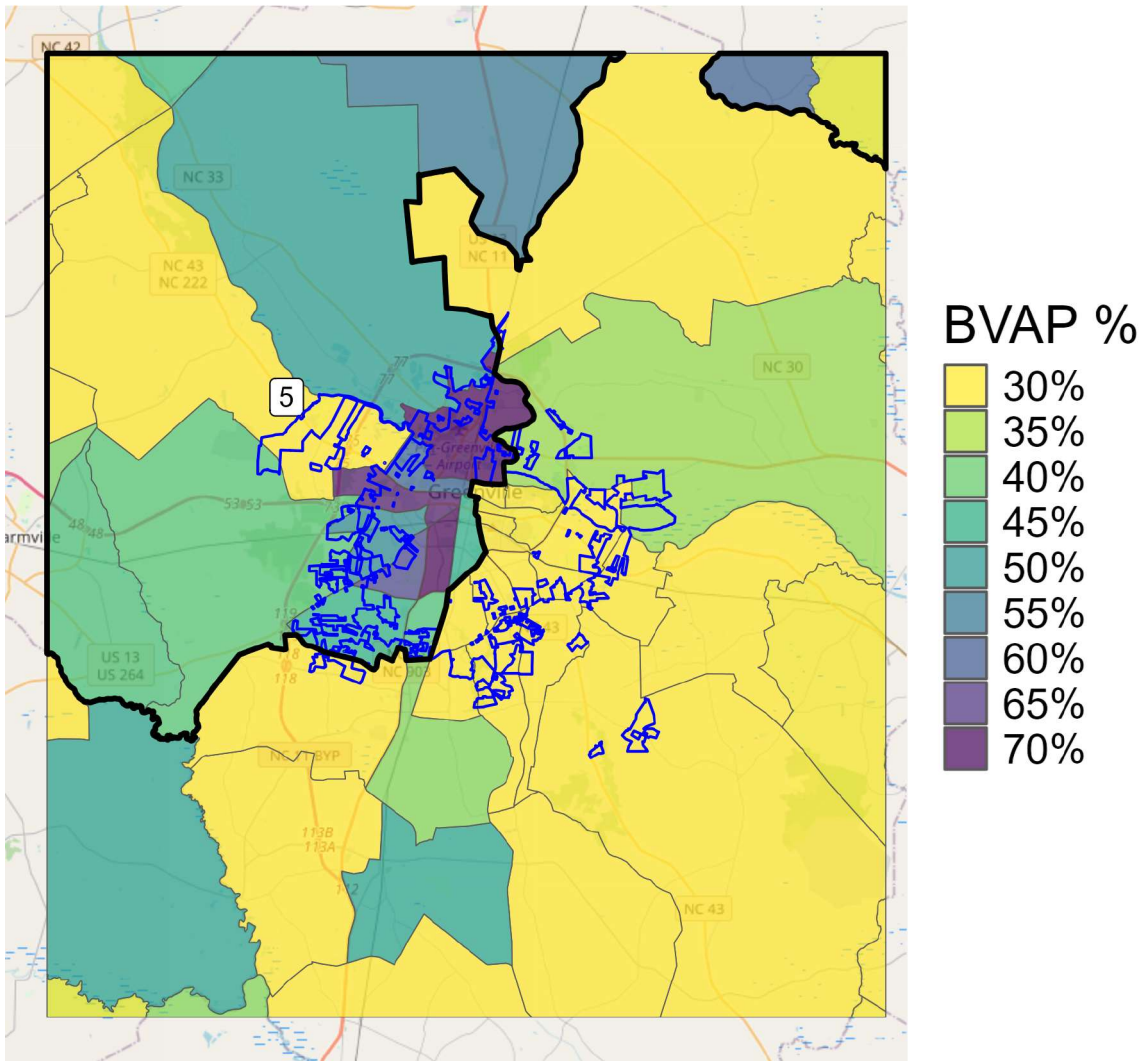
If we zoom in on Rocky Mount and Greenville – which is now split three ways under the map – we can once again see the way the areas are divided up on the basis of race.

Figure 43: Fairfax Senate Illustrative Map A District 5 BVAP, Rocky Mount zoom



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Figure 44: Fairfax Senate Illustrative Map A District 5 BVAP, Greenville zoom



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6.2 Illustrative Map A, District 2

As mentioned, Illustrative District 2 is the same on both maps, so it only needs to be discussed once. It, too, features disparate Black populations linked together across a large district. Once again, because the BVAP is so close to 50%, the district is dependent on scattered Black population in otherwise heavily White counties, such as Chowan and

Gates.

Figure 45: Fairfax Senate Illustrative Map A District 2 BVAP

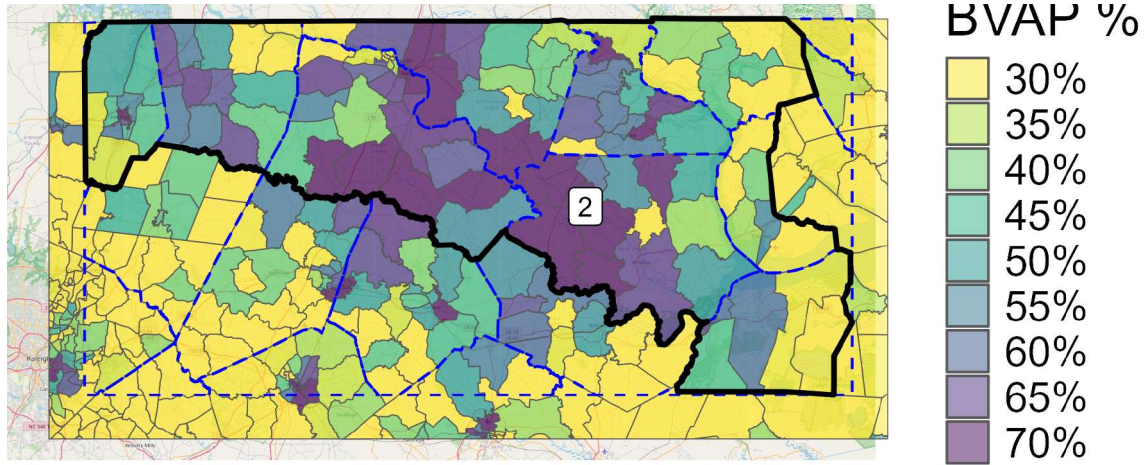
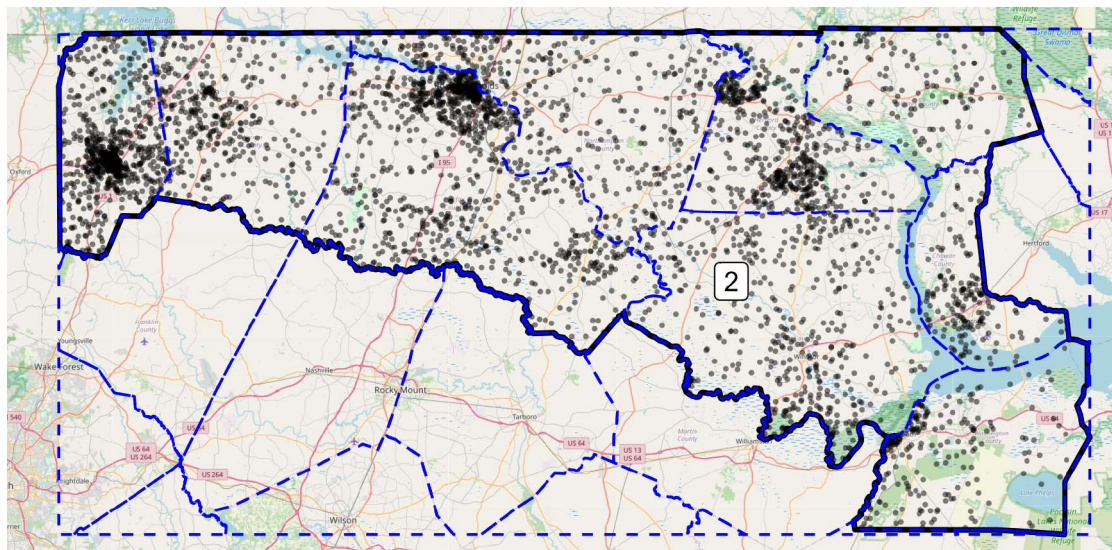
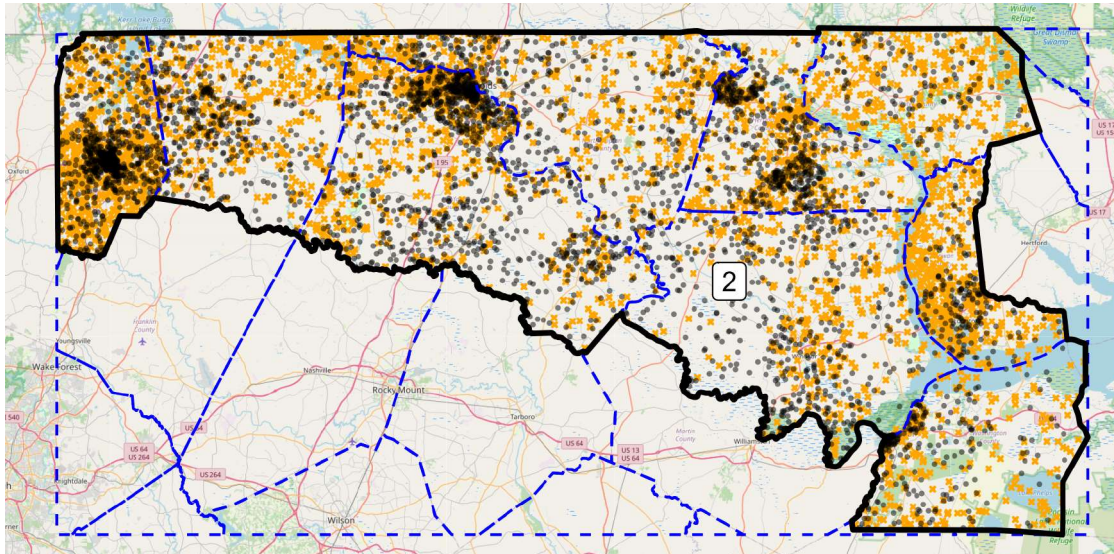


Figure 46: Dot Density Map of Fairfax Senate Illustrative Map A District 2



(a) One black dot = 20 Black residents of voting age

Figure 47: Dot Density Map of Fairfax Senate Illustrative Map A District 2



(a) One black dot = 20 Black residents of voting age. One orange x = 20 non-Black residents of voting age

Finally, Mr. Fairfax's data suggest that the Black communities included in this district have important socioeconomic dissimilarities. For example, Black residents of Gates County have higher incomes than Black residents elsewhere in the district, are much more likely to have a high school degree, are less likely to lack health insurance, are less likely to rent their house, and live in higher values homes.

Figure 48: Demographics of counties in Fairfax Illustrative Map A, Senate District 2

County	% High School Degree	Med. Inc.	% No Health Ins.	Med. Home Val	% Renting
Bertie	76.96%	\$32,522	13.29%	\$74,700	29.84%
Gates	88.66%	\$45,467	5.69%	\$121,100	14.01%
Halifax	77.39%	\$30,508	8.78%	\$86,100	46.94%
Hertford	81.44%	\$39,834	9.12%	\$96,500	40.51%
Northampton	79.34%	\$38,140	11.03%	\$80,900	33.28%
Vance	81.58%	\$39,836	11.40%	\$110,900	54.26%
Warren	81.77%	\$32,469	13.40%	\$85,900	44.02%

7 The county envelopes suggest that Mr. Fairfax's Illustrative Districts are racial gerrymanders

As described in my response to Dr. Rodden, I do not believe that there is any value in the county envelope approach. I do not believe it should be used in the Congressional or in the Legislative cases. However, the panel may disagree. In the event that the panel disagrees and finds that the county envelope approach has value, such value would likely be maximized in a format, such as state legislative seats in North Carolina, where county splits are to be minimized.⁴

To that end, I have applied the county envelope approach to Mr. Fairfax's maps. For every district that he redraws, I have taken the counties he includes in that district, calculated the district centroid, calculated the centroid of each VTD and its distance to the district centroid, and calculated the BVAPs. I have then performed a logistic regression analysis on whether or not the precinct is included in the district, with distance to the centroid and BVAP as the independent variables. Using this approach, half of Mr.

⁴That is because it would eliminate the concern, raised in the Rodden Report response, that the county envelope approach arbitrarily ignores precincts near the district center, but in a different county.

I declare under penalty of perjury under the laws of the State of Ohio that the foregoing is true and correct to the best of my knowledge and belief. Executed on 26 September, 2024 in Delaware, Ohio.

Sean Trende

Sean P. Trende